Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
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Connect America Fund	)	WC Docket No. 10-90
	)	
High-Cost Universal Service Support	)	WC Docket No. 05-337
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APPLICATION FOR REVIEW

ARCTIC SLOPE TELEPHONE ASSOCIATION COOPERATIVE, INC.
COPPER VALLEY TELEPHONE COOPERATIVE

Dated: May 18, 2013

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APPLICATION FOR REVIEW

Arctic Slope Telephone Association Cooperative, Inc. (ASTAC) and Copper Valley Telephone Cooperative (CVTC), pursuant to Section 1.115 of the Commission's rules, respectfully request Commission review of the Wireline Competition Bureau's (WCB's) February 27, 2013 Sixth Order on Reconsideration and Memorandum Opinion and Order in these dockets. The threshold question presented for review is whether the Bureau's use of the current climate variable is based on erroneous findings of fact for ASTAC and CVTC.

ASTAC and CVTC respectfully request the Commission to grant: a) an exception to the 30 day filing rule due to the complexity involved in the non-linear calculations reflected in Exhibits B and C; and b) both carriers interim relief for the entirety of 2013[1] from the prescribed climate variable calculated by the WCB in order to provide a common sense outcome for the operating conditions experienced by each carrier. This requested relief will also ensure that the WCB's Sixth Order, as applied to ASTAC and CVTC, complies with statutory provisions applicable to the Commission.

I. INTRODUCTION AND BACKGROUND

ASTAC and CVTC initiated the process of seeking relief for the climate variable with the WCB in February, 2012. ASTAC included climate variable related discussion in its 2012 ex partes related to its successful expedited data waiver request[2].

[1] In light of the Silver Star Order [DA 13-1013], it may be more appropriate to adjust the QRA results for both carriers beginning at July 1, 2012.

[2] *Connect America Fund; High-Cost Universal Service Support*, Order, WC Docket Nos. 10-90, 05-337, 27 FCC Rcd 14867 (Wireline Comp. Bur. 2012). ASTAC appreciates the corrections the Bureau made for the errors in road miles and road crossings, which represented the completion of a nine month process with the WCB for ASTAC.

In that Order, the Bureau states in part at footnote 8: "*We note that the Waiver Request also asks for changes for other variables included in the benchmark calculations. . . This Order does not prejudge the resolution of these other requests."*

During the ASTAC and CVTC ex parte of February 27, 2013, Bureau staff indicated that the climate issue **might** be addressed as a part of the changes anticipated to be implemented in the 2014 QRA benchmarks. Per NECA's April, 2013 calculations provided to each company, Copper Valley will lose $405,557 during 2013 and ASTAC will lose $265,410 during 2013 if the assumption is allowed to remain that the climate in those study areas is mild, an absurd assumption at best. The time is ripe for the Commission to interject a dose of common sense into the Alaska climate variable issue debate and grant the relief requested in Section V. of this Application for Review.

II. APPLYING A DOSE OF COMMON SENSE AND LOGIC WILL CORRECT OBVIOUS DATA ERRORS WHILE THE BUREAU ADDRESSES 2014 ISSUES

While there are several other Alaska data errors that need to be corrected as a part of the Bureau's 2014 review, the climate variable is the most egregious example of data error for ASTAC and CVTC. Despite repeated attempts to dialogue with Bureau staff with regard to climate issues[3] in Alaska, no discernible progress has occurred.

Simple observation indicates that climate in the state of Alaska is harsher than the vast majority of the lower 48, and the current result of the Bureau's QRA model has

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[3] Blindly following "what the model says" is addressed in work by Belsley and Welch: "*Don't try to model without understanding the nonstatistical aspects of the real-life system you are trying to subject to statistical analysis. Statistical analysis done in ignorance of the subject matter is just that – ignorant statistical analysis*." Belsley, D. A. and Welch, R. E. (1988) Modelling energy consumption – using and abusing regression diagnostics. *Journal of Business and Economic Statistics*, 6, 447.

produced an inequitable result for ASTAC and CVTC. For example, here is some 2012-2013 climate data for Valdez, the corporate headquarters for Copper Valley, from the Avalanche Forecast site, as of May 1, 2013:

Total snowfall since July 1, 2012	379.8 inches (31.65 feet)
Snowfall since March 1, 2013	127.3 inches
Snowfall in April, 2013	48.6 inches

In the ASTAC study area, we provide climate data for a representative exchange:[4]

Average annual temperature 10.4 degrees Fahrenheit
Average annual rainfall 4.16 inches
Average annual snowfall 29.1 inches

From the same data source, we provide data for Valdez and Glennallen in the Copper Valley study area:

VALDEZ

Average annual temperature 38.3 degrees Fahrenheit
Average annual rainfall 67.41 inches (5.62 feet)
Average annual snowfall 327.3 inches (27.275 feet)

GLENNALLEN

Average annual temperature 26.1 degrees Fahrenheit
Average annual rainfall 11.17 inches
Average annual snowfall 55.2 inches

As a comparison for Copper Valley with a climate variable of 2.84, to a carrier with a climate variable of 7.19 (Cordova), we see strikingly similar climate data:

CORDOVA

Average annual temperature 39.1 degrees Fahrenheit
Average annual rainfall 96.26 inches
Average annual snowfall 114.3 inches

[4] Alaska Climate Research Center: climate.gi.alaska.edu. The Barrow exchange is used as there is a climate research station located there.

III. THE CLIMATE VARIABLE IS FLAWED FOR PORTIONS OF ALASKA

The WCB faced a huge challenge in developing a climate variable that adequately captured the vast differences in climactic conditions across the United States. For the circumstances faced by ASTAC and CVTC, the climate variable selected by the Bureau has proven to be deficient.

A. Underlying Climate and Soil data are insufficient

The STATSGO2 dataset used to calculate soil type metric for the *Difficulty* variable in the Quantile Regression Analysis (QRA) was also proposed to measure *Climate* by calculating the number of frost-free days in the study area. Unfortunately, the STATSGO2 dataset did not have consistent data for all study areas, so the Plant Hardiness Index was used as a proxy for the missing information to calculate *Climate*. However, while *Climate* is calculated using a separate dataset, the STATSGO2 database is still used for *Difficulty* even as large swaths of Alaska, including ASTAC, are not accounted for in the database[5].

In the search for an alternative data source by the WCB, the Plant Hardiness Zone map was utilized to measure *Climate* and calculates the average index along roads[6] in each individual study area. The index is a linear scale taking values in increments of 0.5 from 1.0 to 13.5. The variable, upon conception, was hypothesized to be negatively

[5] See Exhibit A for an illustrative example of why the data sets failed for ASTAC. As can be seen in that exhibit, "the requested location for ASTAC is not within the geographical area served by Web Soil Survey." The Web Soil Survey provides public access to soil data for specific areas of interest within the SSURGO and STATSGO2 datasets. [ftp://ftp-fc.sc.egov.usda.gov/NSSC/pub/WSS_brochure.pdf]

[6] The problem with using data based on road miles for ASTAC was previously established in the discussions embedded in the proceeding that granted ASTAC an expedited data waiver request related to the road miles and road crossings variables on November 28, 2012. For a study area such as ASTAC that is larger than the state of Minnesota with only 637 road miles, it is apparent that other data sets based on road mile relationships will be problematic. ASTAC raised the climate issue in its 2012 filings.

correlated with capital expenses, positing that higher temperatures would provide more frost-free days which would imply lower construction costs.

Interestingly, the QRA output for the *Climate* variable exhibits as having a positive correlation with both capital and operating expenses. When a variable behaves opposite to the hypothesized effect, it should be reexamined in an effort to explain the deviation from expected behavior[7]. Our research on this matter indicates that: "*If some standard variable does generate unusual estimates, the anomaly is worth reporting. Even better, it should alert the author before publication that something may be severely wrong with the underlying data or specification* (Hammermesh, pg. 376)." [8]

In this case, such an investigation is warranted, but has not been pursued. A less-than-satisfactory explanation was provided[9] in the QRA Methodology: "*The Climate variable (Climate) is positive and has low p-values in the regressions, which means that it is unlikely to be a spurious result. However, it is positively correlated with capex and opex."*

It is possible that the Plant Hardiness Index is not an acceptable proxy for frost-free days, frost-free days is not a reliable proxy for *Climate*, or it is also possible that

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[7] Kennedy, P. E. (2002) Sinning In The Basement: What Are The Rules? The Ten Commandments Of Applied Econometrics. *Journal of Economic Surveys,* Vol. 16 No. 4, 569-89.

[8] Hamermesh, D. S. (2000) The Craft of Labormetrics. *Industrial and Labor Relations Review* Vol. 53 No. 3, 363-80.

[9] *Connect America Fund*, WC Docket No. 10-90, *High-Cost Universal Service Support*, WC Docket No. 05-337, Order, DA 12-646 (rel. April 25, 2012), paragraph 100. It appears that WCB staff is recognizing there is a counterintuitive result, and falling back on the P-value as a defense. We submit that the P-value does not tell the whole story. The purpose of section II. of the ARF is to submit that common sense must trump faulty statistics.

Climate is absorbing the effects of other "hidden" factors not included in the model, causing the model to exhibit symptoms of Omitted Variable Bias[10].

B. Climate data is non-linear

The QRA model adopted by the Bureau assumes a positive linear relationship for *Climate*. The assumption relies heavily on the logic that as temperature increases, so does the cost of operating a telephone company. Plotting *Climate* against Cost per Loop by company shows that *Climate* does not have a linear relationship with Cost per Loop. The data is very poorly estimated by a linear regression-line. A simple visual inspection of the data in Exhibit B reveals that it does not follow a linear trend.

An alternative assumption would be that it costs more to operate in the *Climate* extremes. It could be assumed that ultra-cold and ultra-hot environments each command their own unique solutions which could, presumably, cost more than operating in a moderate environment. To solve the non-linear relationship a more complicated, non-linear regression equation is necessary to estimate *Climate*. This can be accomplished with a parabolic equation or a higher-order polynomial. We show in Exhibit C that polynomial equations with increasingly higher orders consistently better predict Cost per Loop as a function of *Climate* and should be considered as a replacement for the current linear treatment. As it stands, treatment of a non-linear variable in a linear manner is inappropriate. Despite the complications of modeling a non-linear variable, the erroneous climate data warrants an exception for ASTAC and CVTC.

[10] Omitted Variable Bias (OVB) is bias found within regression parameters that arise from an incorrectly omitted independent variable, known or unknown that is correlated with the dependent variable and one or more of the independent variables. OVB causes the model to over or underestimate parameters to compensate for the omitted variable.

IV. OTHER FEDERAL AGENCIES RECOGNIZE CONSTRUCTION COSTS ARE HIGHER IN ALASKA

There are many sources that corroborate the known fact that construction costs in Alaska are unique and extraordinary. Some portions of the QRA development process appear to have been done in a vacuum, as there are multiple sources that corroborate that construction costs are higher in Alaska[11] due in large part to climactic conditions.

According to a Department of Defense (DOD) study released January 16, 2004[12], there are a multitude of factors that must be considered when constructing in the Arctic. Among these factors, supply of labor, transportation, maintenance and scheduling all contribute to higher costs. In the arctic there is a short supply of skilled labor. When a project must be constructed, skilled labor is brought in from other regions, requiring additional expenses for housing and feeding workers. The labor must be paid at a premium due to the long hours that must be worked during the short construction season. Materials must also be transported long distances to Alaska, as many of the materials required for construction are not available locally. Considerations must be made for pre-fabricated parts, as fabrication in the arctic can be an expensive and time-consuming endeavor. The "construction window" is dictated by season when the sun is in the sky for the majority of the 24-hour cycle, and when the ground temperature is raised enough to begin digging. Shipments of materials by barge cannot be made until the sea ice breaks apart which occurs simultaneous with the onset of the construction season. Delays during this time shorten the construction season and cause the remaining work to be more expensive. In order to mitigate delays, more expensive forms of shipping are used to

[11] The Bureau's attempt to create a variable to recognize the unique circumstances of operating in Alaska worked against Alaska carriers by assigning a negative coefficient to Capex.
[12] DOD UFC 3-130-07 www.wbdg.org/ccb/DOD/UFC/ufc_3_130_07.pdf

guarantee timely arrival of materials. Projects are often scheduled over multiple years as the construction season is not long enough to complete a full project. Bringing labor in year-by-year adds additional costs to the construction project.

V. AN INTERIM ADJUSTMENT FOR 2013 IS APPROPRIATE FOR THE CLIMATE VARIABLE FOR ASTAC AND CVTC

While we understand that the WCB staff is working to produce a new result for 2014, it is not acceptable to penalize two Alaska carriers during the entirety of 2013 while these errors are being corrected. Thus, an interim solution is required and shown below:

Average Climate Factor Methodology – The Proposed interim variable adjustment for Arctic Slope and Copper Valley for 2013 FCC QRA inputs

A methodology was developed to derive an average value for use as a temporary fix to the *Climate* variable input for Arctic Slope Telephone Association Cooperative and Copper Valley Telephone Cooperative in the QRA model for 2013.

The methodology used was a "mean of means" that used *Climate* values found in the support data released for the 2013 QRA by the FCC. The climate data was sorted into groups by state and territory containing each company listed within the state or territory. A mean was then calculated for each group, representing the average climate value for each state and territory. After, a mean was calculated from the total distribution of state means. The resulting figure, 6.683093, represents the average climate value of each of the average state climate values. The average climate figure should be used as an interim

solution until a non-linear solution can be implemented. Using an average provides a temporary yet equitable 2013 treatment for ASTAC and CVTC.

The resulting figure is more robust than taking a simple average for *Climate*, as the outliers and extreme values found in the raw data are "smoothed over" by the first round of averaging. Furthermore, the new *Climate* value accounts for each state and territory's unique climatic conditions.

VI. THE GRANT OF RELIEF REQUESTED BY ASTAC AND CVTC COMPORTS WITH STATUTORY PROVISIONS APPLICABLE TO THE COMMISSION AND WITH PREVAILING JUDICIAL PRECEDENT

Despite repeated requests by ASTAC and CVTC for more equitable treatment with respect to the climate variable, the Bureau has refused to affect such a change. We are concerned that the effect of the Sixth Order as applied to our two companies resembles an unconstitutional Bill of Attainder[13] which the United States Supreme Court applied against Congressional or legislative acts. We are concerned that we have been targeted for differential punitive treatment, as we are outside of the parameters of the "market-based" economic model favored by the Bureau. With delegated authority[14] from the Commission comes a responsibility to act prudently and equitably with respect to the laws in effect with respect to confiscation[15].

[13] *United States v Lovett*, 328 U.S. 303, 315 (1946).
[14] The "power to regulate is not a power to destroy. . ." *R. R. Comm'n Cases*, 116 U.S. 307,331 (1886).
[15] *Bluefield Waterworks & Improvement Co. v Public Service Comm'n of West Virginia*, 262 U.S. 679, 692-693; 42 S. Ct. 675 (1923)

VII. CONCLUSION

For centuries, models used without testing against reality have provided results that have later been refuted[16] or been viewed as silly. From the "earth is the center of the universe" belief to the "earth is flat" assumption, the ability to integrate "real-life experience" has proven to be the important last step in any "modeling" process.

Nobel Laureate economist Milton Friedman stated this issue well with the following view:

I have long had relatively little faith in judging statistical results by formal tests of significance. I believe that it is much more important to base conclusions on a wide range of evidence coming from different sources over a long period of time.

In the previously cited Hammermesh article from footnote 8, Hammermesh builds off of Friedman's quote by imploring the statistician to "*search for additional evidence, both corroborating evidence, and, especially, discomforting evidence. If your theory is correct, are there testable implications? Can you explain a range of interconnected findings? Can your theory encompass its rivals in the sense that it can explain other models' results?"*

The climate data found on page 5 of this Application for Review provides a strong dose of discomforting evidence. We respectfully request the Commissioners interject a dose of common sense and logic into the debate on the climate variable for ASTAC and CVTC and grant the interim relief requested and direct the Bureau to make similar adjustments in any 2014 data.

[16] In a May 30, 2012 letter from David Cohen of US Telecom to the Commission, one of the points raised was how it was counter-intuitive to have a positive correlation between lower cost and fewer frost-free days.

Exhibit A

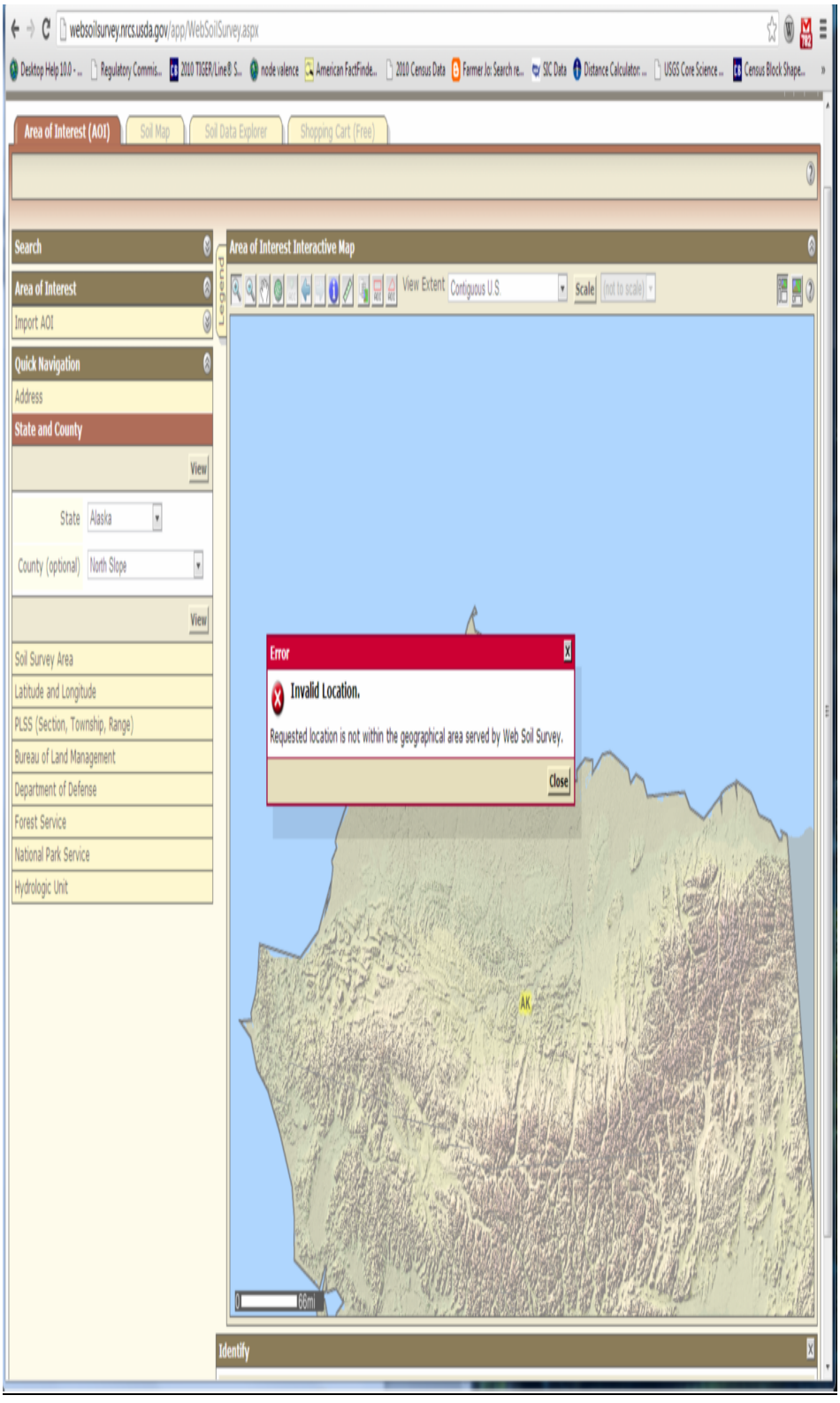
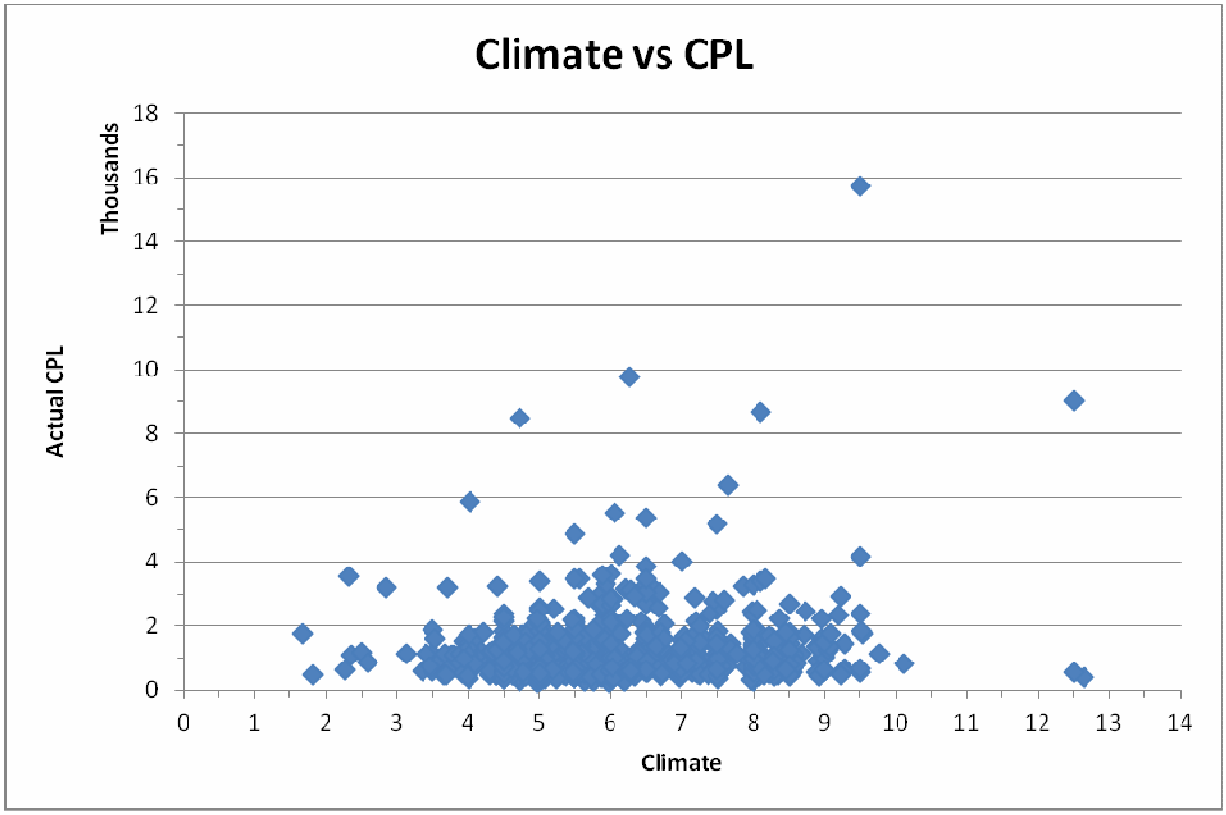
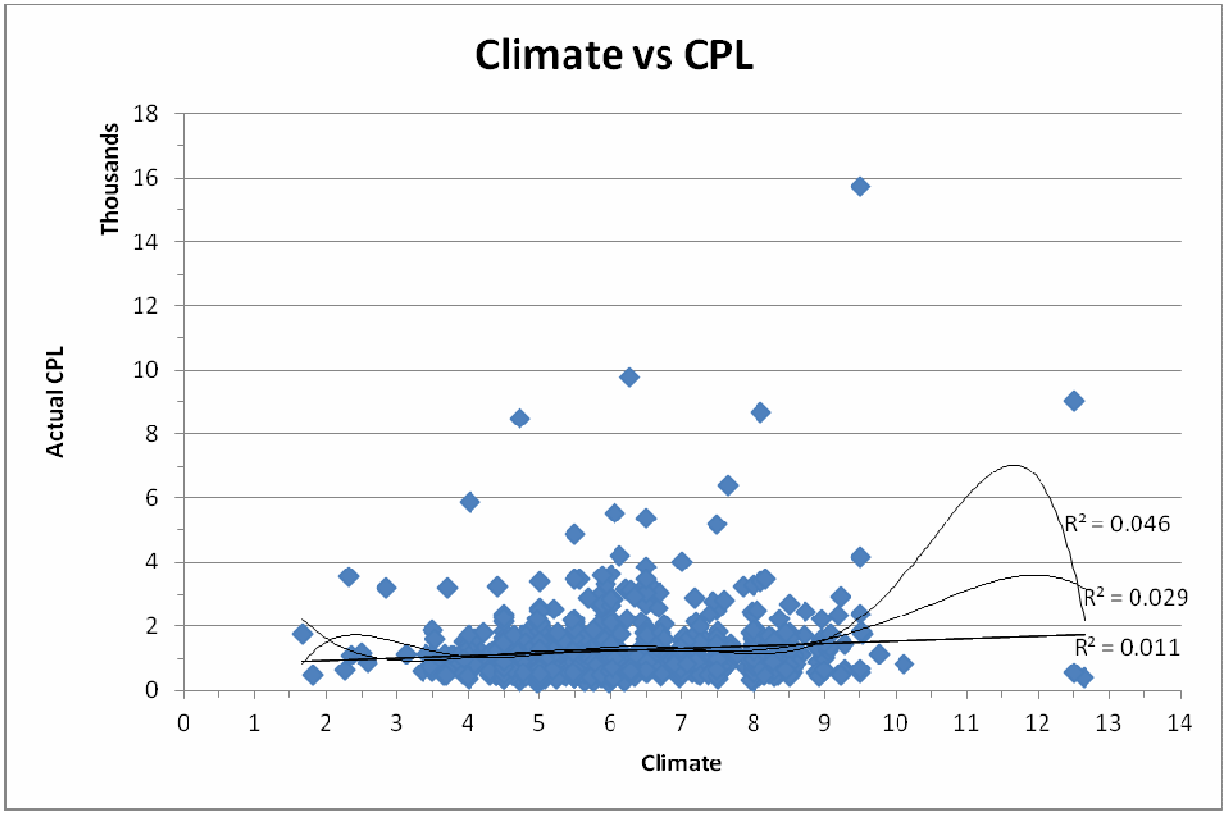

websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx
Area of Interest (AOI)
Soil Map
Soil Data Explorer
Shopping Cart (Free)
Search
Area of Interest
Import AOI
Quick Navigation
Address
State and County
View
State Alaska
County (optional) North Slope
View
Soil Survey Area
Latitude and Longitude
PLSS (Section, Township, Range)
Bureau of Land Management
Department of Defense
Forest Service
National Park Service
Hydrologic Unit
Area of Interest Interactive Map
Legend
View Extent: Contiguous U.S.
Scale: (not to scale)
Error
Invalid Location.
Requested location is not within the geographical area served by Web Soil Survey.
Close
AK
68mi
Identify

Exhibit B



The Climate Data does not follow a neatly linear trend. Data points are unevenly distributed around the "suggested" linear trend line.

Exhibit C



$y = -0.8185x^6 + 32.261x^5 - 498.85x^4 + 3855.5x^3 - 15576x^2 + 30795x - 21628$
$R^2 = 0.046$
A 6th order polynomial trend line that better estimates climate costs at the extremes.

$y = -1.1338x^5 + 40.188x^4 - 531.68x^3 + 3281.4x^2 - 9357x + 10861$
$R^2 = 0.029$
A 5th order polynomial trend line that shows improved prediction power over the current linear treatment of *Climate*.

$y = 73.834x + 799.88$
$R^2 = 0.011$
The current linear treatment of *Climate* shows poor prediction power of cost.

Higher order polynomials are consistently better at predicting climate costs at extreme climate zones.

Respectfully submitted,

Via ECFS at 5/18/13

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